Analytical Approaches for Characterizing the Diffusion of New Medical Technologies

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Abstract

The last two decades have been characterized by dramatic changes in the use of atypical antipsychotic drugs, most of which are prescribed by psychiatrists and financed by public programs. In this talk, approaches to summarizing antipsychotic drug prescribing behaviors for three new therapeutically-similar drugs using dispensing information for nearly 17,000 U.S. physicians between January 1, 1997 and December 31, 2007 are described. While logistic models are commonly used to study the diffusion path of a new technology, several features of prescription data complicate inferences. These include time-varying drug choice sets due to different launch dates, semi-continuous response data, and multivariate outcomes. We begin with examining time to first prescription of a new antipsychotic, estimating diffusion paths separately for each new drug using non-parametric approaches. Next, we estimate multivariate survival models to identify fixed physician characteristics related to adoption time. When then utilize all antipsychotic prescription data and estimate key parameters of the diffusion path for each physician individually. The physician-specific parameters are combined using Bayesian multivariate factor analysis approaches to provide a parsimonious representation of drug prescribing behaviors.

This work is funded, in part, by grants U01-MH103018 and R01-MH093359, both from the National Institute Mental Health.

Note: Taking photos during the seminar is prohibited.